SECTION 15125

PLUG VALVES

PART 1 - GENERAL

1.01 SCOPE

The Contractor shall furnish and install plug valves, complete and operable, as shown and specified herein, appurtenances, operators, and accessories.

1.02 RELATED WORK SPECIFIED ELSEWHERE

Section 15100, “Valves, General”

PART 2 - PRODUCTS

2.01 PLUG VALVE

A. The plug valves shall be of the non-lubricated eccentric type, with resilient faced plugs, and shall be designed for a minimum working water pressure of at least 150 psi for valves through 36-inch. Plug valves 20-inch and smaller shall have an 80 percent minimum port area. Plug valves 24-inch and larger shall be full opening with 100 percent port area. Plug valves, 8-inch and smaller shall be designed for operation in a horizontal pipeline with the valve shaft in a vertical position. Plug valves larger than 8-inch shall be designed for operation in a horizontal pipeline, with the valve shaft in a horizontal position and the operating shaft in a vertical position. The plug valves shall be as manufactured by DeZurik - a unit of General Signal, Olson Technologies, Inc., or approved equal, and shall be the standard product of a manufacturer which has produced and sold such equipment for a period of at least five (5) years. Valves shall be suitable for buried, submerged service.

B. Flanged valves shall have ends plain-faced and drilled conforming to ANSI Standard B16.1, "Cast Iron Pipe Flanges and Flanged Fittings", Class 125. Bolt holes in the flanges shall be equally spaced and shall straddle the vertical and horizontal centerlines. All joint materials for flanged valves will be furnished by others.

C. Mechanical joint valves shall have ends complying with ANSI/AWWA Standard C111/A21.11. "Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings". Mechanical joint gaskets, glands, tee-head bolts and hex nuts shall be included with the valve. Segmented glands or follower glands held in place by set screws will not be acceptable. Bolt holes in flanges of the mechanical joint shall be equally spaced and shall straddle the vertical centerline. Gaskets shall be shipped separately in suitable protective containers. Valves shall have neoprene gaskets.

D. Plug valve body and plug shall be of cast iron conforming to the requirements of ASTM Standard A126, "Gray Iron Castings for Valves, Flanges and Pipe Fittings", Class B, and all exposed nuts, bolts, springs, washers, and similar component items shall be AISI Type 316 stainless steel. Resilient plug facing shall be of neoprene.

E. Plug valves shall be furnished with a corrosion-resistant seat consisting of a welded-in overlay of

high nickel content on all surfaces contacting the plug face and shall comply with ANSI/AWWA Standard C507, "Ball Valves, 6 In. Through 48 In. (150 mm Through 1200 mm)", Section 3.2.

F. Plug valves shall be furnished with replaceable, sleeve-type AISI Type 316 stainless steel bearings in the upper and lower journals, and shall comply with ANSI/AWWA Standard C507, Section 3.2.

G. Plug valve shaft seals shall be designed for replaceable, manually adjustable, multiple ring "V" or "U" type packing of Buna-N or neoprene. The valves shall be of the bolted-bonnet type and shall comply with ANSI/AWWA Standard C507, Section 3.

H. Plug valves shall have stops at the fully-opened and fully-closed positions.

I. Plug valves shall be designed for drip-tight shut-off in wet service applications at pressure differentials up the full rating of the valve with pressure in either direction. Plug valves shall be provided with a manual operator sized to suit the maximum differential pressure across the valves. Minimum plug valve operator output torques shall equal or exceed the values specified in the following table:

PLUG VALVE SIZE	REQUIRED ACTUATOR 100 PSI	OUTPUT TORQUE 150 PSI
12"	1,063 FT-LBS	1,438 FT-LBS
14"	1,638 FT-LBS	2,225 FT-LBS
16"	2,213 FT-LBS	3,013 FT-LBS
18"	3,300 FT-LBS	4,500 FT-LBS
20"	4,388 FT-LBS	5,975 FT-LBS
24" (100%)	10,000 FT-LBS	12,790 FT-LBS
30" (100%)	15,875 FT-LBS	19,550 FT-LBS

J. Manufacturer shall supply operators producing larger output torque values if so required by their valves, but in no case shall operator output torque be less than that shown for the particular valve size and pressure.

K. In addition, the operator shall be capable of withstanding an input torque of 300 ft.lbs. on the operating nuts or a pull of 200 pounds on the handwheel without damage to operator components between the input and the stops. Operators on valves 30-inch and larger shall also be equipped with an AWWA input shaft stop.

L. All external ferrous items, except cast iron, shall be hot-dipped galvanized in accordance with ASTM Standard A123, "Zinc (Hot-Galvanized) Coatings on Iron and Steel Products", or ASTM Standard A153, "Zinc Coating (Hot-Dip) on Iron and Steel Hardware", or stainless steel.

M. Manual operators for valves 8-inch and smaller shall be lever actuated unless otherwise specified elsewhere herein.

N. Manual operators for valves 10-inch to 24-inch shall be totally enclosed traveling-nut or worm gear type, permanently lubricated, suitable for buried and/or submerged conditions.

O. Manual operators for valves 30-inch and larger shall be totally enclosed worm gear operators, permanently lubricated, suitable for buried and submerged operation, and shall be Limitorque type HBC, or approved equal, in accordance with ANSI/AWWA Standard C504-94, with AWWA input shaft stop.

P. Manual operators shall be provided with completely enclosed mounting brackets or adapters. The operators shall be equipped with adjustable stops to prevent overtravel in both the open and closed position with standard 2-inch square operating nuts with skirts and extension shafts as listed elsewhere herein, or with handwheel if for above ground service. All plug valves shall open by turning the operating nut or handwheel counterclockwise. Orient operators with horizontal plug shafts such that the plug rotates upward upon opening.

Q. Operator extension shafts shall be designed and furnished by the valve manufacturer and shall each be complete with coupling, AWWA standard 2-inch square operating nut with skirt, shear pins and centering-identification plate, for connection to the valve operator (or input) shaft as specified in Section 15100 “Valves, General”.

R. All operator components between the operating nut and the adjustable stops shall be designed to withstand, without damage, an input torque of 300 ft. lbs.

S. Torque limiting device: See Part 2 of Section 15100, "Valves, General".

T. The exterior valve surfaces shall be shop painted with two coats of asphalt varnish conforming to Federal Specifications TT-C-434A.

U. Testing: Plug valves shall be tested in accordance with ANSI/AWWA C504, “AWWA Standard for Rubber-Seated Butterfly Valves”, Section 5, Subsection 5.2. The performance test (Subsec. 5.2.1) and hydrostatic test (Subsec. 5.2.3) shall be performed as stated, however the leakage test (Subsec. 5.2.2) shall be performed bidirectionally; first on one side of the valve, and then on the other. The manufacturer shall furnish a certified test report with every valve stating that the valve has met the requirements of the tests.

PART 3 - EXECUTION

3.01 GENERAL

A. All valves shall be installed in accordance with provisions of Section 15100, "Valves, General." Care shall be taken that all valves are well supported.

B. The Contractor shall install valves with seats on the downstream side and unless shown otherwise, set valve (above 8-inch size) with the main axis of the plug horizontal.

C. Inspect a valve fully open and then tightly closed and test the various nuts and bolts for tightness before installation. Take special care to prevent any foreign matter from becoming lodged in or on the valve seat. Any valve that does not operate correctly shall be removed and replaced.

D. The installation of a buried eccentric plug valves shall include the installation of a concrete bearing pad and a ductile iron riser pipe, complete with valve box and cover, set in concrete. The valve operator shall be installed with the extension shaft, coupling nut, and data plate supplied by the

valve manufacturer, which shall be supported as previously specified and shown on the Plans.

E. After the coupling has been welded to the extension shaft, the weld shall be wire brushed and painted with Kop Coat Bitumastic No. 50, or approved equal.

F. For all quarter-turn plug valves installed, the Contractor shall paint the underside of the valve box cover with red paint.

END OF SECTION